

(2½ Hours)

[Total Marks: 75]

- N. B.: (1) All questions are compulsory.
 (2) Make suitable assumptions wherever necessary and state the assumptions made.
 (3) Answers to the same question must be written together.
 (4) Numbers to the right indicate marks.
 (5) Draw neat labeled diagrams wherever necessary.
 (6) Use of Non-programmable calculators is allowed.

1. **Attempt any three of the following:** 15
 - a. Explain the working of Goal based agent with diagram.
 - b. What is Artificial intelligence? Explain with example.
 - c. What is the purpose of Turing test?
 - d. Explain PEAS description for taxi's task environment.
 - e. Explain any five properties of task environments.
 - f. Write a short note on foundation of Artificial intelligence.
2. **Attempt any three of the following:** 15
 - a. Explain depth first search algorithm with suitable example.
 - b. Explain Hill climbing algorithm in detail.
 - c. Explain 8-queen problem using the concept of genetic algorithm.
 - d. Formulate Vacuum world problem.
 - e. Explain how algorithm's performance can be evaluated.
 - f. Differentiate between informed Search and uninformed search with suitable example.
3. **Attempt any three of the following:** 15
 - a. Explain min-max algorithm with suitable example.
 - b. Write a note on card games.
 - c. What is meant by conjunctive normal form? Explain.
 - d. Explain simple knowledge-based agent.
 - e. Explain wumpus world environment giving its PEAS description.
 - f. Explain resolution theorem with suitable example.
4. **Attempt any three of the following:** 15
 - a. What is first order logic? Discuss basic elements of first order logic.
 - b. Explain the process of knowledge engineering.
 - c. Explain following w.r.t. First Order Logic. 1. Term 2. Atomic Sentences 3. Complex Sentences 4. Universal Quantifiers. 5. Existential quantification.
 - d. Explain how A.I is useful in Electronic Circuits Domain.
 - e. "The law says that it is a crime for an American to sell weapons to hostile nations. The country Nono, an enemy of America, has some missiles, and all of its missiles were sold to it by Colonel West, who is American".
Formulate this knowledge in First order logic.
 - f. Explain in brief about unification algorithm.
5. **Attempt any three of the following:** 15
 - a. What are events? Explain its importance.
 - b. Write Planning Domain Definition Language (PDDL) description of an Block worlds,
 - c. Explain planning graph in detail.
 - d. Explain Forward (progression) state-space search algorithm.
 - e. Explain semantic network with example.
 - f. Explain Internet shopping research agent in detail.